Irrigation Sector Situation of the Kingdom of Cambodia

Lim Kean Hor

INTRODUCTION

PRESENTLY, THE NEWLY elected Government of the Kingdom of Cambodia has no real definite policy on government ownership of medium-to-large-scale irrigation schemes, or the possible "Transfer-of-Management" to farmers.

By attending this conference and discussing this issue, we hope to be better prepared to advise the Government on the options available and their consequences.

BACKGROUND

Historical Overview of the Irrigation Sector in Cambodia

Cambodia's long history of hydraulic control goes back to the pre-twelfth century Angkor Empire of canal and control structures. During the early part of the twentieth century under French colonial rule, the amount of irrigation development was still small, with the exception of the Bovel Network in Battambang. Indigenous water control methods were widely practised with local participation varying according to different regions and topographical features of the country.

During independence from 1953 to 1970, with outside influence and aid from the United States, irrigation development was encouraged, but this development project was crippled after US aid was terminated in 1963. The "self-aid" policy of the Sihanouk Government during this time, with the introduction of a "water policy" at the grass roots level was successful in terms of making local people more aware of water issues.

As a result of that water policy, tremendous efforts from every segment of the population contributed to the development of local irrigation facilities, and the results were generally satisfactory.

During this period, relationships between the government authorities and water users were good, with efforts being made by the former to coordinate the management responsibilities of operation and maintenance of the main system. However, due to the lack of official records, details of this coordination are not clear. It is clear, however, that after completion of construction, it was the task of the irrigation authorities of the Rural Engineering Department to manage them with close links with the local people. The farmers had primarily local irrigation facilities, as large-scale irrigation project construction had only just begun, when unfortunately, the war broke out in 1970.

In 1975, after the takeover by the Khmer Rouge Regime, the entire country was transformed into a forced labor camp. As a result of the Khmer Rouge totalitarianism, based on state ownership, collectivisation, and particularly deadly rules, irrigation development accelerated. However the costs were unbelievable, with over 1 million deaths. A major work force was mobilized to work 14 to 16 hours per day on building canals, dams and reservoirs throughout the country, during nearly four years of Khmer Rouge occupation. The Khmer Rouge or "Pol Pot" irrigation systems were reportedly built without a strong technical foundation or topographical studies.

Sometimes, a dam was built during the full course of water flow and many lives were destroyed as the dam collapsed. The building of new paddy fields of one square hectare each, designed with a small canal along the dike, caused a negative impact as far as water control is concerned. The old system of [banted] paddy fields was not only a form of water control but was also a series of small embankments to prevent the minor floods from damaging the crop. When these were destroyed and replaced by the new long dikes, the floods generally reached the fields more freely.

The Khmer Rouge strategy is believed to have achieved some progress in terms of having sufficient water for double crops throughout the year. However, this was done at great human cost.

Recent Irrigation Sector Activities

The Department of Agricultural Hydraulics and Hydro-Meteorology (DAHHM) is the present democratically elected government agency responsible for all irrigation development tasks. After the defeat of the Khmer Rouge, it was known as the Department of Hydrology (DOH) but it started with only 4 trained staff members from the former *Genie Rural*. The DOH received assistance at this time from the Soviet Union by way of heavy equipment, construction materials,

experts and training. It also received technical assistance in survey, design and training from Vietnam; and assistance by way of heavy equipment from Nongovernment Organizations (NGOs).

NGO assistance increased in the form of design and construction of projects with Provincial and Central DOH, provision of construction material and pumps, training staff abroad, and direct technical support to the Central DOH. The situation became extremely difficult during this period due to the continuing state of reduced security facilities and budget available, in combination with the United Nation (UN) embargo on Cambodia.

The Soviet Union and Vietnam drastically curtailed aid grants to DOH towards the end of the 1980s. NGOs were providing advisors to Central DOH by 1986, and have been doing project work with Central and Provincial DOH staff in rural areas since 1988, ranging from building small-scale weirs and culverts to rehabilitation of medium-scale irrigation projects. NGO assistance increased rapidly after 1988, and shortly after the signing of the Paris Peace Accords in October 1991, water sector aid included pump irrigation projects of thousands of hectares and a joint NGO support program to the Central DOH in addition to small grass roots development projects.

In 1991, UN agencies started returning to Cambodia with project support, particularly in refugee resettlement areas, and for emergency rehabilitation projects. The UN presence swelled with the arrival of United Nations Transitional Authority in Cambodia (UNTAC) during the transition period leading to the election of May 1993. By this time, there were over 100 NGOs involved with projects in Cambodia, and UN agencies were building roads and rehabilitating the large-scale Bovel and Barai irrigation schemes. The successful May 1993 election led to the formation of the Royal Cambodian Government and the withdrawal of UNTAC in September 1993.

Multi- and bi-lateral agencies are now slowly returning to Cambodia and most are considering areas in which to provide assistance in the future. In response, the NGOs are moving away from continuing assistance at central levels towards their more traditional work at the grass root level. This is leaving a gap in terms of support to the Central DAHHM. The monthly irrigation sector meeting is open to all interested agencies and currently includes about 30 NGO, international multi- and bi-lateral organization, as well as the Central, Provincial, Municipal, and District DAHHM staff.

ANALYSIS OF CURRENT SITUATION AND ROLE OF IRRIGATION

At present. approximately 15 percent (276,600 ha) of the cultivated area in Cambodia (1,844,000 ha) is irrigated in the classical sense, from canals conveying water directly to fields from the source. It is estimated that it is physically possible to double this area. There are 3 types of this mode of irrigation:

* Wet season lowland rice with supplementary irrigation--9 percent (166,000 ha).
* Dry season lowland rice with irrigation--2 percent (37,000 ha).
* Flood recession rice with supplementary irrigation--5 percent (73,600 ha).

The engineering aspect alone needs a great deal of study before a sound design of dam reservoir and canal can be established. It is unlikely that conditions in the country will permit the development of a technical cadre adequate for such development in the short term; however, small-scale development is feasible, with farmer participation in design, construction and operation.

Large-Scale Multi-Purpose Systems

Currently none are being operated or under construction. The Mekong Secretariat and other interested organizations are currently examining 3 to 4 systems for possible rehabilitation or construction.

Uncertainty prevails due to the large financial commitment required, the continuing security problems in project areas, and the possible effects of upstream development of the Mekong River Basin.

To design, construct, operate and maintain projects of this complexity and scale are beyond the scope of the current Cambodian Government, and would take 7 to 10 years to complete, even if they were started immediately by external agencies.

Medium-Scale Irrigation and Hydraulic Works

Several projects have had their headwork completed, with work continuing on distribution systems, community organization and extension activities. Operation and maintenance have been the major problems with these systems to date.

Few projects of this size are justifiable solely on economic terms, but some can be considered worth building when other factors are taken into account. Ten Projects of this size have been identified for pre-feasibility studies by the on-going United Nations Development Project (UNDP) Irrigation Rehabilitation Study of Cambodia.

Work on these projects has been undertaken by NGOs and International Organizations (IOs), in partnership with the Central or Provincial DOH offices. The DAHHM has not yet completely implemented a medium-scale project on their own, although they have had a role in most of the different project phases.

Small-Scale Irrigation Systems

Although these systems are less costly and easier to implement with the participation of the people, they are still very complex in nature and require significant material and strong technical support. Several systems have been completed up to now.

Work on these projects have been undertaken by NGOs in partnership with the Central, Provincial or District DAHHM and DOA. Operation and maintenance of these systems has been a major problem to this point in time. Several projects have failed entirely, particularly pump irrigation projects.

The remainder of the arable land in Cambodia (84%) is classified either as under rain-fed wet season rice, deep water floating rice, or upland rice and other crops. In reality, much of the area receives supplementary water in addition to rainfall, though not through formal distribution systems. As a result, it can often be considered as being supplementarity irrigated as well. These areas were also greatly affected by the "Pol Pot" works. These areas require agricultural hydraulic works, usually of small scale, to provide improved drainage, flood protection, access to water for supplementary irrigation and water for fisheries, livestock and domestic use. As such, this work also falls under the mandate of the Provincial DAHHM and has formed the basis for several successful projects with the NGOs. While these projects will not provide multiple cropping, they are very important for ensuring the single rain-fed crop badly needed by the majority of the people, and for other rural development activities.

PROPOSED STRATEGY

It is clear that the major constraint that handicaps agricultural production is the present state of war in the country. Irrigation development undoubtedly is one of the top priorities for increased agricultural production. The King's water policy suggests that development should have as its initial focus the rehabilitation of existing facilities.

1) Large-scale multipurpose systems are a long-term development option.

   There are insufficient data available and little local capability at present to analyze the hydrology of the catchments and the environmental impact of projects in Cambodia, within a very short period.

   It is recommenced that technical and material support be given to the Cambodian government offices engaged in gathering, coordinating and analyzing this and other necessary data as an immediate first step. Training Cambodian staff of all concerned agencies should also be an immediate priority.

   No large project should begin before there is a comprehensive watershed management plan for its catchment.

2) Medium-scale irrigation systems and hydraulic works are a mid- to long-term development option.

   Longer lead times required for project studies should be used for supporting community development and extension activities, possibly in conjunction with local or foreign NGOs. The extension agents and community workers should play an active role in irrigation development. There should be agreement and participation of local people in all project activities.

   Great care should be taken with respect to engineering properties of the soils used in construction, and measures for alleviating problems from this must be considered.

   Post-construction support for agricultural extension and other community development work should be included in any project to assist in the process of change and institutional development required.

3) Small-scale hydraulic works are an immediate and on-going development option.

These projects are simple, cheaper to build, and are identified and built by the villagers with some technical and material assistance from the Province, or the District government.

These types of projects are needed throughout the country, not just within well-defined irrigation systems.

These projects can be designed, constructed and managed by Local Government staff with back-up support from the Central DAHHM. These projects are strongly endorsed by King Sihanouk, and formed much of the work of the *Genie Rurale* and local efforts of indigenous design in the past.

They are the most appropriate for the current situation and should be supported immediately with technical and material assistance and funding. They offer the best chance for constructing successful projects throughout the country and provide valuable experience and training for all levels of Cambodian government staff and farmers.

INSTITUTIONAL ISSUES

Provincial and District DAHHM Offices will carry the burden of support for small-scale irrigation systems and hydraulic works as well as for operation and maintenance of medium-scale irrigation systems and hydraulic works. They will require the following:

1. There is a need to consider existing plans and institutional structures in order to avoid the formulation of a series of incompatible, externally imposed programs.

2. It is important to link with other donors/outside agencies to increase compatibility of projects, common approaches, cross-learning and to avoid conflicts. Participation in sector meetings can help in this. Donor agencies should work closely with existing NGOs in project ares.

3. The watershed approach is very important, and cannot be carried out if people do not coordinate with or inform others of their project activities. There needs to be an overall coordination structure within the government for the water resource development sector.

FARMER INVOLVEMENT IN ALL PROJECT ACTIVITIES

Farmer involvement means their active participation in all phases of the project from the pre-design stages, through the design, construction, and operation and maintenance stages. This means that farmers are not just a labor force, and that they should be included in management and given responsibility, training and ownership as well. This also means that project terms of reference must be flexible enough to allow changes after consulting local farmers and considering their legal status. This is absolutely necessary for projects to be sustainable.

There is a need for flexibility by financing bodies to allow for the extra time, effort and cost that are connected with increasing farmer involvement and ownership in project development.

Community organizers and water user groups are a useful means of encouraging farmer involvement but these efforts should be integrated within other rural development activities as well, e.g., marketing and purchasing.

ECONOMIC CONSIDERATIONS

The benefits of irrigation include: risk reduction, especially keeping people out of the debt cycle due to a single crop failure; security and stability of rural areas; providing dignity and livelihood to the rural poor; strengthening of communal and religious ties; and reduced migration and urban problems. In practice too, any water source is used for more than just irrigation.

It is an NGO experience that double cropping of rice as a criterion to justify irrigation is not feasible in most areas due to poor soil, high input costs and low product prices, as well as cropping patterns which generally mean that cropping occurs in different hydraulic regimes and different areas rather than on the same plot all the time. Irrigation can, however, open possibilities for alternate crops, fisheries, livestock, or for the growing of organic matter for soil improvement.

There should be a moral obligation to help farmers given the history of the past 24 years and the role of foreign powers in the destruction of Cambodia.

Projects that are economically more feasible will also most likely be in communities that are better off, being closer to roads and markets, with better soil and more water resources. Donors need to accept this and designate grant funds to develop the poorer areas. Special consideration should be given to the disabled, the landless and other poorer groups. They deserve increased opportunity, and genuine line participation.

CONCLUSION

Different countries require different strategies of prioritization for irrigational development, based on the great variations existing in local social, political, environmental, economic and historic situations. In the case of Cambodia, with its lack of financial resources, uncertain administration, war, and the variety of local conditions, a dependence on basic farmer participation is essential.

Therefore, the strategy for irrigation development in Cambodia calls for a further development of small-scale facilities at the local level throughout the country, and the rehabilitation of existing facilities. A strategy encouraging irrigation associations to allow the farmers to participate fully is imperative.

For Cambodia, future potential and current contributions of water development to agricultural production are challenging and impressive. In facing the challenge, it is important to have an enlightened, unprejudiced, and multi-disciplinary approach, because it is a responsibility that has to be shared equally by all classes of participants, farmers, planners, advisors, and decision makers. It is imperative because the agricultural resources of the country, which are believed to be promising, have never been developed accordingly.

The Cambodian participants hope that they will learn greatly from this conference through the sharing of ideas and discussions. They hope that it will be another step in the direction of improved sustainable irrigation development and management for Cambodia.

We would also like to take this opportunity to invite staff from IIMI and all countries to visit Cambodia and begin a partnership for the future. (Thank you very much.)

Acknowledgements

We would like to thank the sponsoring bodies which made our attendance possible, including the following:

International Management Institute (IIMI)
Food and Agriculture Organization of the United Nations (FAO)
International Cooperation for Development and Solidarity (CIDSE)
Mennonite Central Committee (MCC)
Australian Catholic Relief (ACR)
Department of Agricultural Hydraulics and Hydro Meteorology (DAHHM)

We would also like to thank Mr. Veng Sakhon, Vice Director DAHHM; Mr. Chres Buntha, Provincial Vice Director DAHHM; and Mr. Srey Heang, Irrigation Agronomist, Provincial Department of Agronomy (DOA).